IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISCTRICT OF TEXAS
HOUSTON DIVISION

EXXON MOBIL CORPORATION, Plaintiff v. UNITED STATES OF AMERICA, Defendant	)	Civil Action Nos. H-10-2386 (LHR) H-11-1814 (LHR)

DECLARATION OF MATTHEW A. LOW

I, Matthew A. Low, declare as follows:

1. I am over 18 years of age, and I am fully competent to make this declaration. I reside at 3507 Legation Street, NW, Washington, DC 20015.

2. I have been asked to prepare a declaration in support of the United States' Opposition to Exxon Mobil Corporation's (Exxon's) Motion for Summary Judgment. Specifically, I have been asked to address Exxon's assertion that, "[G]iven the evidentiary record in these cases, Plaintiff's proposed allocation methodology is reasonable and equitable and should be adopted by the Court for a number of reasons."

3. I am an attorney and an engineer, and have used these disciplines for the past thirty-eight years as a practitioner in the fields of environmental law and alternative dispute resolution. For the past twenty-six years, I have addressed equitable cost allocation issues in numerous Superfund cases, primarily as an arbitrator, mediator or settlement counselor and, occasionally, as an expert witness. I have appeared before courts and court-appointed magistrates in my capacity as a neutral. I also have testified in court as an allocation expert.

4. My updated resume and a list of my cost allocation cases, including cases in which I have testified by deposition or in court, are included in Attachment 1 to this declaration. It lists eighty-nine (89) selected cases (many involving multiple manufacturing facilities and sites) in which I am serving or have served as an arbitrator, mediator, settlement counselor, or expert to develop allocation recommendations. I have served successfully as an arbitrator or mediator in thirty-two (32) cases, seven of which were court-sponsored assignments and one of which was an EPA Pilot Allocation Project. My role in these cases has been to analyze the evidence in the record, to attempt to distill technical, scientific, and historical information, and to consider relevant allocation factors and recommend an objective and fair allocation. I have

written three publications regarding allocation and arbitration of cases brought under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) and one EPA manual regarding investigating potentially responsible parties at hazardous waste sites.

5. The majority of cases on which I have worked have involved major manufacturing sites. These cases typically require an analysis of the often lengthy history of operations at the site, including production, material handling and waste storage and handling processes, and the relationship between those operations and the contamination problem at issue.

6. I am serving or have served as a settlement counselor to the U.S. Department of Justice in forty (40) cases, most involving one or more large manufacturing sites, in which government involvement has been alleged during certain periods, including World War I and World War II. My role as a settlement counselor is to create allocation frameworks that deal with the panoply of issues relating to areas of concern within these manufacturing sites that are being remediated, and to provide objective analysis and advice during discussions, negotiations and mediation with the private party claimants. Twenty-six (26) cases on which I have worked for DOJ have settled based, at least in part, on my allocation frameworks, and eleven (11) are still in negotiation. In one case, I served strictly as an allocation expert, and another case is in litigation on the interpretation of contract indemnity language. This matter is the only one not currently in negotiations.

7. My involvement in this matter under contract to DOJ began during the early stages of settlement discussions, in October, 2005. I have provided services like those described above throughout the intervening period, assuming the role of potential expert witness on allocation issues sometime after the Baytown complaint was filed in March, 2010.

8. I have prepared two expert reports in this matter. The first, dated August 10, 2012, proposes an allocation methodology for this matter. The second, dated November 16, 2012, comments on Exxon's proposed methodology. I hereby adopt and incorporate them by reference as my testimony.[1] The reports are meant to be exchanges between parties and experts, however, and it is my intention in making this declaration to at least limit the need for reference to the much more detailed treatment of the issues found there. I will borrow language from my expert reports on occasion, and I will use examples whenever possible to illustrate my opinions. Finally, since Exxon's methodology is similar for both Baytown and Baton Rouge, as a way of simplifying this explanation, I will focus primarily on the Baytown facility, only briefly mentioning some examples with regard to the Baton Rouge facility. In addition, I also will focus on the past costs claimed by Exxon for units and areas of groundwater contamination at the refineries.[2]

[1] Since preparation of these reports, I have prepared errata sheets to correct some computations on the Excel worksheets attached to my reports. .

[2] Exxon's approach also is applied to calculate an allocation percentage for unknown future costs. But, in the absence of any concrete information on what contaminants might ultimately require cleanup or what activities led to the release of these contaminants and what costs may actually be incurred, there is no basis to support the use of Exxon's methodology to calculate a percentage for such speculative future costs.

9. My objective in this declaration is not to suggest that the court decide at this time to adopt my proposed allocation methodology, as it is my understanding that the United States has not asked the Court to do so at this time. Rather, I have been asked to point out how Exxon's allocation methodology, which, relies on a series of assumptions that are not adequately supported by the record, produces a highly anomalous and inequitable result. Its foundational assumptions and the way it has been implemented rely on highly disputed facts.

10. I have made an extensive review of the documentation developed in this litigation to date, including the documentary record and various reports from other experts. I have particularly reviewed the allocation report of Mr. White (Exxon's allocation expert), and – because he did not produce his spreadsheets – have recreated a working form of his model in Microsoft Excel format, establishing "switches" that allow me to modify his various assumptions and conclusions to test the impact each assumption has on his "production-based model." This declaration is based exclusively on information that I believe a mediator or allocation consultant would routinely rely on in similar circumstances. The opinions set forth below are my own, and I am prepared to testify to them, to explain their basis, and and to defend them if necessary.

EXXON'S APPROACH

11. Exxon's approach consists of:

- First – Identifying periods of "Exxon[3]-only" involvement and periods of "joint Exxon/U.S." involvement that it asserts contributed to the contamination and resulting response costs at issue. The period of joint Exxon/U.S. involvement generally includes a period from sometime in 1941 through 1955 based generally on Exxon's claim that the U.S. was an "operator" as that term is used in CERCLA during the World War II (WW II) period (1941-1945) and the Korean War period (July 1950-June 1953) and an "owner" under CERCLA of various Plancors adjacent to the refineries during various years between 1942 and 1955. The Exxon-only periods include the years 1921 until sometime in 1941 and 1956-1985. The time frame used by Exxon to bound the period of Exxon-only involvement is incorrect, inasmuch as some of the units for which past costs are claimed were in use or impacted by contaminating activities after 1985.

- Second -- Once these periods are identified, Exxon's methodology assigns shares of total refinery throughput to the periods of Exxon-only involvement and the period of joint Exxon/U.S. involvement. As I understand it, these calculated shares are intended to represent the impact of each year and each period on contamination and resulting response costs. Exxon asserts that this allocation share is calculated using a "production-based" methodology. However, Exxon's approach is not truly a production-based approach inasmuch as the final result is driven by several multipliers used by Exxon to "adjust" production volume – adjustments that are not factually supported or suspect from an equitable perspective.

[3] In this declaration, I use "Exxon" to denote Standard Oil or Humble or other corporate predecessors of Exxon at Baytown and Baton Rouge Refineries.

- Third -- Once the allocation shares for the Exxon-only and joint Exxon/U.S. periods are calculated, Exxon's methodology then allocates the joint U.S/Exxon share between the U.S. and Exxon. Here again, there are major issues relating to the assumptions underlying Exxon's approach, including, among others, whether or not 100% of the refinery output during the World War II or the Korean War periods should be allocated to the U.S, whether the U.S. should be allocated a share as an "operator" for the WW II and Korean War periods, and if so, whether the U.S. should be allocated 75% of the "operator" share (as compared to Exxon's 25%) for either period.

- Fourth – Exxon's approach increases the U.S. share by adding what it calls a "delay component," which applies Exxon's WW II allocation percentages for the U.S. share in years after WW II. There is no factual support for the either the assumptions relied on by Exxon or the methodology used in the calculations for this component.

- Finally, Exxon's allocation adds a contract component, based on its view that WW II Avgas contracts contain an indemnification provision. Exxon's methodology assumes that the U.S. would be responsible under this provision for 100% of the share attributable to the WW II period. Because its allocation assigns 100% of refinery production to "war products," the proposed "contract" adjustment, effectively assigns the entire WWII share of production to the United States. Yet the Avgas output at Baytown was only 14% of the total plant output and at Baton Rouge, it was only 19%.

Thus, how the Exxon's approach calculates the production assigned to the joint Exxon/U.S. period (the starting point for calculating a U.S. share), and how that share is then allocated between Exxon and the U.S., are the paramount issues in evaluating Exxon's proposed methodology. In addition given that Exxon's proposed delay component factor and contract claim factors are important factors mathematically in determining the final U.S. share, whether there is any factual or legal support for the adjustment is likewise a significant issue.

CALCULATING THE ALLOCATION SHARE FOR THE PERIOD OF JOINT EXXON/U.S. INVOLVEMENT

12. As I will discuss below, there are a number of reasons why I believe that Exxon's proposed allocation methodology should not be adopted in this case to develop the allocation share for various periods of Exxon-only and joint-Exxon/U.S. involvement.

13. To begin with, at each refinery, Exxon is claiming costs for multiple solid waste management units and multiple areas of groundwater contamination. While these units and areas may have been within a single, very large facility, each of them was used and/or impacted in different ways over different time periods by different activities. In a sense, each one of these units or groundwater contamination areas can be considered a separate "site" for allocation purposes. They were each investigated separately, each was impacted by different types of contamination, and the remediation plan is different for each one. Because the contamination present in these different units and areas are, in most cases, the result of different types of operations and contaminant release mechanisms, an examination of these facts should be

conducted for each one for allocation purposes. Although these various areas may be contained in a larger CERCLA "facility," it is common for an allocation analysis to include an explanation of the nature of the remedial actions and the history of use of each of the units or groundwater contamination areas for which cost have been claimed. Mr. White's description of his methodology does not include such an explanation. Instead, as explained further below, Exxon's allocation approach at both refineries relies on a single series of unsupported assumptions pertaining primarily to the refinery wastewater treatment systems, which are then applied similarly to each solid waste management unit or area of groundwater contamination regardless of their use or what impacted them or the time period over which they were impacted.

14. In order to calculate the shares for the Exxon-only and joint Exxon/U.S. periods, Exxon relies on what it asserts is a "production-based" allocation methodology, using crude throughput capacities for the years 1921-1985 at Baytown and 1911-1985 at Baton Rouge as a surrogate for production during those years.[4] Exxon's methodology then applies a series of "adjustment multipliers," which are multiplied together to derive a combined multiplier, which is then multiplied against crude throughput capacity figures for the years after the period of joint Exxon/U.S. involvement. These multipliers, in effect, reduce the "production" numbers after the period of U.S. involvement, thereby, disguising the impact of the extraordinary growth of the refineries in the years after any U.S. involvement ended in1955. The net result is a reduction of 97% or more for every year in which production is calculated after 1959. For example, at Baytown, crude throughput figures are multiplied by 3.0%. At Baton Rouge, the multiplier is 0.78%

15. As a general proposition, use of a production-based approach (whether relying on actual production data or, as in this case, relying on crude throughput data) can be an acceptable methodology if the increases in production are reasonably related to response costs at issue and if the methodology is applied in a way that reasonably takes into account that relationship. Exxon's methodology does not meet this criterion. Rather, the major outcome-determining feature of Exxon's approach is the reliance on application of the above-mentioned "adjustment multipliers." There are two major reasons why this approach is not supported by the record:

a. The facts do not support the derivation of the adjustment multipliers and their application to the response costs at issue; and

b. Exxon's adjustment multipliers are applied across-the-board to all units and areas of soil and groundwater contamination for which past costs are being claimed regardless of how the units, soils, or groundwater contamination areas were used or impacted over time. There is no evidence in the record supporting application of a single adjustment multiplier indiscriminately to all units or groundwater contamination areas.

16. To understand the anomalous results produced by Exxon's methodology, one can compare the results of a pure production-based allocation with the results produced by Exxon's

[4] My understanding is that either actual production figures or actual crude throughput figures may be available for all or most years, but have not been produced yet by Exxon. If available, either would provide a more accurate picture of actual increases in production.

approach. In the case of the Baytown and Baton Rouge refineries, production increased significantly after the periods of U.S. involvement – by more than 350 percent at Baytown between 1945 and the late 1970s. Thus, for example, for the Baytown refinery, on the basis of crude throughput capacity data used in Exxon's calculations, and just counting the years 1921-1985, the allocation between the relevant periods would be:

Periods	Dates	Crude Throughput*	%
Exxon Only	1928-1941	674,154,500	10.86%
Exxon/U.S. -- WW II (Avgas and U.S. Plancor Ownership)	1942-1945	281,050,000	4.53%
Exxon/U.S. (U.S. PlancorOwnership Only)	1946-July 1950; June 1953-1955	616,363,333	9.93%
Exxon/U.S. -- Korean War (Avgas and U.S. Plancor Ownership)	July 1950-June 1953	328,986,667	5.30%
Exxon Only	1956-1985	4,305,923,583	69.38%
		6,206,478,083	

*****Based on Baytown Crude Throughput Capacity -- 1921-1985

17. If one counts just the years of U.S. alleged involvement in Avgas production at the refinery proper (i.e., the WW II 1942-1945 and Korean War July 1950- June 1953 periods), where most of the units for which Exxon is claiming costs are located, the share for the joint Exxon/U.S. period, based solely on crude throughput, is less than 10%. If one extends the "Exxon-only" period to at least 1995,[5] as is entirely appropriate for some of the units and groundwater contamination for which past costs are claimed, the two wartime periods account for less than 6% of the total crude throughput.

18. On the face of it, then, the results actually calculated in accordance with Exxon's allocation methodology seem counter-intuitive. For example, for the Baytown Refinery, which Exxon has operated from 1921 to the present, a period of over 90 years, Mr. White calculates the waste load effectively attributed to the approximately 14-year period (1942-1955) of joint

[5] One fact in dispute as it relates to Exxon's methodology is what end date to use for the various solid waste management units and groundwater areas for which costs are claimed and whether a single end date is appropriate for all units/areas and all costs. Mr. White uses an end date of 1985 for the Exxon-only period in his calculations, A number of units for which Exxon is claiming costs were in use and/or impacted by refinery operations subsequent to that date (through at least 1995) and Exxon's own data on spills indicate that additional contribution to groundwater contamination (which make up the majority of Exxon's Baytown past cost claim) most likely continued past that date. *See* Low August 10 Report at pp. 17-23.

Exxon/U.S. involvement at close to 50%[6] and calculates the Exxon share for the entire period from 1956-1985 at less than 10%.

19. The seminal determinant of the above result is Exxon's reliance on a series of very large and unsupported multipliers to, in effect, reduce the "production" figures for the years after U.S. involvement. The application of these specific multipliers across the board is unique to this facility and their derivation and application to the response costs at issue in this case are wholly unsupported

20. I do not believe that it is inherently unreasonable to consider the impact of refinery modifications in an allocation analysis, provided that data are available to reliably and credibly account for changes in the refinery that may have impacted the contamination actually being remediated and the corresponding response costs. However, as I noted in my November 16, 2012 Rebuttal Report, the available data do not provide a reliable basis for making the types of waste-reduction assumptions relied on by Mr. White, particularly as they relate to the specific units and groundwater contamination areas for which Exxon is claiming costs.[7] Instead of relying on data, Mr. White and other Exxon experts appear to have seized upon selected statements in Exxon documents as a basis for assuming major reductions in response cost impacts per barrel of crude throughput after the period of any U.S. involvement and then applied these assumptions equally to every single unit or groundwater contamination area at issue, regardless of how each unit or area was impacted by refinery operations. In my opinion, given the lack of support in the record for applying these adjustments to allocate the response costs in question, the use of this methodology in this case is unacceptable. In fact, after considering a similar approach to allocation in this matter, I concluded that there simply is an absence of reliable data that would support such an approach for the response costs at issue and that a more equitable approach is based on years of operation.[8]

EXAMINATION OF EXXON'S "ADJUSTMENT" MULTIPLIERS AT BAYTOWN AND BATON ROUGE

21. The major adjustment multipliers used by Mr. White at both Baytown and Baton Rouge are derived from entirely different sources, and Mr. White has not explained how they are related and why they should be multiplied by one another to produce a combined adjustment multiplier of 3.0% at Baytown and 0.78% at Baton Rouge. The use of these multipliers in Exxon's methodology effectively assumes that the impact on all of the response costs of a barrel

[6] This percentage is increased even further by application of what Mr. White has referred to as a "Delay Component." I discuss this factor below.

[7] See, generally, Low November 16, 2012 Report at pp. 5-15.

[8] See, Low August 10, 2012 Report at pp. 13-14. Mr. White, in his declaration supporting Exxon's Summary Judgment Motion, notes that a years of operation approach fails to account for fluctuations in production or waste reductions. However, if there are no reliable data to show how fluctuations in production or waste reductions impacted the units or groundwater plumes actually being remedied, there is no basis upon which such fluctuations or reductions can be reliably taken into account.

of crude oil processed at Baytown in 1944 is over 33 times greater than the impact of a barrel of crude processed in any year after 1959.[9] At Baton Rouge, this would mean that the impact on response costs of the year 1944 would be more than 125 times greater than the impact of the year 1972. Exxon has not established a plausible factual basis for concluding that the impact of each barrel in 1944 had such disproportionate impacts on contamination and claimed response costs at each refinery.

Baytown Production-Related Waste Efficiency Multiplier

22. In allocating the Baytown Refinery units and groundwater remediation costs, Mr. White "adjusts" the annual crude throughput capacity figures for the years after U.S. involvement by multiplying them first by what he terms the "production related waste efficiency" multiplier (30%) and then again by what he terms the "pre-separator impacts" multiplier (10%). As noted above, he then multiplies these two multipliers together to produce a combined adjustment multiplier of 3.0% -- meaning that if the actual crude throughput in a given year is 100 million barrels the "production" total used in the allocation calculations for that year would be only 3 million barrels.

23. The "production related waste efficiency" multiplier is phased in after 1950 and assumes a 70% reduction in separator sludge after 1957. This translates into a 30% multiplier against crude throughput for years after Exxon/U.S. involvement. The magnitude of the multiplier appears to be based on a single 1958 journal article, authored by an Exxon employee, indicating that separator sludge generation in 1957 was 4,000 tons per day compared to 10,000 tons per day in 1947, which, taking into account the increase in crude throughput from 1947 to 1957, does compute to a reduction of 70% per barrel of crude throughput. However, no evidence is cited as to what happened to the volume of separator sludge after 1957 and it is noteworthy that the author of the 1958 article relied on by Exxon had just four years earlier (1954) indicated in another journal article that the refinery's separator sludge generation was still 10,000 tons per day, despite the fact that the refinery modifications that are cited as having produced the sludge reduction had been fully implemented by 1952. At the very least, then, the actual volume of separator sludge generated after 1957 is open to question. Exxon has produced no data on this issue.

24. Moreover, even if one assumes that the 70% reduction in separator sludge per barrel of crude oil throughput was accurate for all years after 1957, there remain questions regarding whether and, if so, to what extent, a reduction in separator sludge had any impact on any of Exxon's claimed response costs involving soil removal at various units and remediation of areas of groundwater contamination. In my opinion, Exxon has not produced support that would

[9] In his Baytown and Baton Rouge refinery unit allocations, Mr. White adds a third multiplier which he terms "Regulatory-Based Efficiencies" or "RCRA." As explained by Mr. White, this multiplier is intended to take into account Mr. White's view that regulations enacted in the late 1970s and implemented in the early 1980s, led to activities that "necessarily reduced the releases or possible releases of contaminants from the waste processing systems and general operations at the Complex." White Report, p. 54. Thus, for example, this multiplier (arbitrarily assigned at 85%), applied from 1980 forward, reduces the combined multiplier used in the calculations for the Baytown refinery to 2.55% -- meaning that the impact on response costs of a barrel of crude oil processed in 1944 is over 39 times greater than the impact of a barrel processed in 1980.

justify applying this multiplier, or even a less impactful multiplier, to any of the units or areas of contamination.

25. If any units were potentially affected by a reduction in separator sludge, they would be Separators 10 and 3M and the South Landfarm for which Exxon is claiming the following response costs.

- **Separator 3M** – Past Cost plus Interest = $5,133,657
- **Separator 10** – Past Costs plus Interest = $849,894
- **South Landfarm** -- Past Costs plus Interest = $1,858,170[10]

But even for these units, the connection between the amount of separator sludge and the response costs for excavating soils is not established. Separators work by providing a means for oil, water and solids to separate. The oil evaporates or is skimmed off the top, the contaminated water (or effluent) is discharged ultimately to the plant's outfall and the sludgy solids (separator sludge) are allowed to accumulate up to the separator's capacity and then removed. In this case, the sludge accumulating in Separator 10 was pumped to Separator 3M and ultimately removed periodically when Separator 3M reached its capacity. In order for the 30% reduction multiplier to be at all relevant, there would have had to have been a 70% reduction separator sludge accumulated in Separators 10 and 3M. However, in 1947, when the 10,000 tons per day of separator sludge was ostensibly being generated, there were a number of separators around the Baytown Refinery separating out oils and generating sludge. At that time Separator 10 was not the only separator accumulating and generating sludge and, therefore, Separator 10 was not the location of all of the separator sludge being generated at the refinery. In the 1950s, the other separators at Baytown were taken out of service and sewers were consolidated so that they all fed into Separator 10. Thus, the cited reductions in separator sludge from 1947 to 1957 in the single, cited article do not conclusively demonstrate that there was an equivalent sludge reduction in Separators 10 and 3M. It is possible that, due to closures and consolidations, as well as modifications to make Separator 10 more efficient, Separators 10 and 3M might have actually experienced an increase in sludge generation. And, as mentioned above, there is no data on the amount of separator sludge generated in Separators 10 and 3M either before or after 1957.

26. In addition, there are unresolved factual issues over how the fluctuations in sludge volume relate to the response costs claimed by Exxon. While Exxon has not provided a breakdown of how costs were expended on closure of Separators 10 and 3M, Exxon's Closure Plans and Final Closure Reports indicate that closures of these units involved removal of recently accumulated sludge as well as soils at the bottom of both units that had become contaminated over time. The recently accumulated sludge was not attributable to operations during the years of joint Exxon/U.S. involvement. Based on Exxon's Closure Plans for these units, the soils would have had to be remediated to meet cleanup requirements for a number of contaminants,

[10] The South Landfarm is involved only by virtue of Exxon's contention that some portion of soils removed from Separators 10 and 3M in 1985, and placed in this unit should be attributed to the U.S. As noted in my August 10, 2012 report (pages 18-19), the U.S. had no involvement in creation or operation of the South Landfarm and there is, therefore, no basis to hold the U.S. accountable for costs related to this unit. In addition, the record shows that, of the materials placed in the South Landfarm, soils from closure of Separators 10 and 3M were a negligible percentage.

including chromium, lead, nickel, oil and grease, benzene, toluene, cresols – ortho, meta, para, phenol, pyridine, and methyl ethyl ketone.[11] Any one of these contaminants, if exceeding cleanup parameters, could cause excavation of soils at greater depths and at increased costs. Exxon's closure reports contain no information on the depth of excavated soils and no data on the contaminants or their various concentrations that dictated the depth of soil excavation. Without knowing which contaminants were driving the costs and the concentrations of such contaminants in the sludge or underlying soils over time, it is not feasible to quantify precisely how, or even if, the volume of sludge over time impacted these response costs.

27. Both of these units were in continuous operation from at least 1928 to 1985. Sludge was accumulating in these units on a continuous basis. Thus, even if there was an overall reduction in sludge volume, there would still have been sludge accumulating in Separator 10 and Separator 3M at all times, potentially leaching contaminants into the soils. Mr. White provided no analysis and no explanation concerning how alleged reductions in separator sludge volume would have impacted (one way or the other) the amount or concentrations of the above contaminants in the soil, the maximum depth of soils in which cleanup standards were exceeded, or the volume of soil excavated and the corresponding costs. To the extent that reductions in sludge volume actually allowed the sludge to accumulate for longer periods of time, it may have even exacerbated the impact of leaching contaminants into the soil. In any event, even the impact of the reduction in separator sludge on the two units having the most potential to be impacted by fluctuations in separator sludge is a fact that is in dispute.

28. More importantly, based on the record, there does not appear to be any direct or proportional connection between a reduction in separator sludge volume and the response costs for the other various Baytown units and groundwater contamination areas at issue. They include the following:

- **Upper and Lower Outfall Canals Area** -- Past Costs plus Interest = $11,891,968
- **Refinery Groundwater --** Past Costs plus Interest = $12,587,618
- **SWMU Investigation --** Past Costs plus Interest = $6,438,732
- **Velasco Street Ditch --** Past Costs plus Interest = $2,288,044
- **Baytown Ordnance Works --** Past Costs plus Interest = $7,149,735
- **Facility Operations Area (FOA) --** Past Costs plus Interest = $1,490,114
- **PRP Investigation --** Past Costs plus Interest = $154,346

29. Of the approximately $41 million of past costs claimed for actual remediation of refinery units at Baytown, over $26 million were expended for remediation of refinery groundwater plumes, the refinery's outfall canals and an area in the northern part of the facility known as the Velasco ditch. Another $7 million is being claimed for a groundwater plume alleged to be associated with the Baytown Ordnance Works (BOW), an area unrelated to the refinery proper (which is now part of the Exxon's Baytown Chemical Complex adjacent to the refinery). Groundwater contamination is impacted by leaks and spills in pipelines, tanks and

[11] See, e.g., Partial Closure Plan for Separator 3M, February 17, 1984, BAYTECH 00013407, pages 3-7 to 3-9. In particular, it was noted that API separator sludge was listed as a hazardous waste because of the leachable chromium and lead content.

operating areas, as well as numerous unlined waste disposal areas throughout the refinery. The Velasco Ditch is in an operating area upstream of the separators and not impacted by separator sludge. And the effluent that enters the outfall canal is the liquid discharge from the separators, rather than any sludge accumulated in the separators. Exxon offers no basis to conclude that the fluctuations in the amount of separator sludge impacted the contamination in these areas or the corresponding response costs for remediating these areas and, thus, no factual predicate for application of a 70% discount (and use of a 30% "adjustment" multiplier against crude throughput) to these units or areas, or otherwise, across the board.[12]

Baytown Pre-Separator Impacts Multiplier

30. The "pre-separator impacts" multiplier (10%), which is again extended to all years and all units in the Baytown refinery beginning in 1952, is based on Mr. White's assumption that "three pre-separators collectively reduced effluent contamination by 90%."[13] This translates into a 10% multiplier against crude throughput in the years following Exxon/U.S. involvement. (phased in from 70% in 1952- 10% in 1959). The underlying assumption seems to be misplaced, and at the very least is the subject of a factual dispute. It is apparently based on Exxon's over-reading of a single page of an Exxon report, apparently attached to a 1964 permit application. That reference states:

> The pre-separators remove the oil that can be easily separated: they are covered to prevent loss of low boiling hydrocarbons into the atmosphere. Approximately 90 percent of the oil in the waste water is removed at the pre-separators. **This materially reduces the oil lost by evaporations on the master separator**. (emphasis added)[14]

The import of the above-quoted language is that oil, which previously was being lost to evaporation in the master separator, was now being recovered more efficiently. But, as indicated by the quoted statement, the oil recovered in the pre-separators was the easily separated oil that would have otherwise evaporated and, therefore, would not have become entrained in the sludge that settled to the bottom of Separator 10 (the "master" separator) that was subsequently pumped to Separator 3M, or in the underlying soils in these two separators. There is no factual basis to assume that the 90% adjustment multiplier assumed by Mr. White has any applicability to the concentrations of the constituents of sludge migrating to the underlying soils or of effluent discharged from the separator.

31. More importantly (at least in terms of past costs), this factor is subject to the same additional problem as the 30% Production-Related Waste Efficiency Multiplier. Again, there is no basis to conclude that the installation of pre-separators had any impact on refinery

[12] *See*, Low November 16, 2012 Report at pp. 8-11.

[13] White Expert Report, p.53.

[14] BAYC-00013637 at 13644.

groundwater plumes, the outfall canals, the Velasco ditch or the Baytown Ordnance Works groundwater plume.[15]

Baytown Ordnance Works

32. One particularly striking example of the inappropriate extrapolation Mr. White proposes to make based on the alleged reductions of oily materials in the Baytown wastewater stream is his allocation of the costs associated with the BOW groundwater plume. The BOW, part of Exxon's chemical complex, is not part of the refinery and the production levels and operations at the refinery had no relationship to the production levels and operation of the BOW. In fact, Exxon has failed to produce any data on production levels for the BOW or the actual operation regime for this facility after it was purchased by Exxon in 1946, so the actual figures are unknown. Other evidence generated by Exxon's own remediation contractors, however, affirmatively suggests that equipment installed and products produced well after the period of U.S. involvement were sources of much of the contamination in the groundwater.[16] There is no apparent reason to question this evidence – particularly given that Exxon's experts had objective reasons for needing to find the sources of the plume so that they could confirm that those sources were controlled. I often rely on this sort of information in the absence of more precise indications of contaminant sources. Yet, Mr. White appears to have ignored this evidence entirely, using the same methodology and same set of assumptions for allocation of the BOW as he uses for the allocation of the units and groundwater contamination in the refinery.

Baton Rouge Multipliers

33. At Baton Rouge, Exxon's methodology also relies on two separate adjustment multipliers, which are again, without explanation, multiplied together to produce a combined adjustment multiplier. This combined multiplier is again applied indiscriminately to each of the units at this refinery for which Exxon is claiming past costs regardless of how they were used or impacted by refinery operations. One multiplier is based on early 1950s documents showing a reduction in slop oil. Mr. White takes a projected 61% reduction in slop oil[17] in 1951 compared to 1944 and applies a 39% crude oil throughput multiplier to all response costs claimed at the refinery for all years subsequent to 1955 without citing any evidence that reduction in slop oil has any impact on the response costs at issue.

34. Mr. White's second multiplier is based on Exxon reports showing an anticipated reduction of 98% in oil content in effluent leaving the refinery – which Mr. White translates into a 2% multiplier. Mr. White assumes, without explanation, that a reduction in oil content of the effluent over the 1959-1972 timeframe translates into a reduction in response costs for each of the units for which Exxon is claiming past costs.

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[15] *See*, Low November 16, 2012 Report at p. 11.

[16] *See*, Low November 16, 2012 Report at pp. 28-29.

[17] Slop oils are useable oils recovered from various points in the refinery that can be reprocessed. They can be recovered at production equipment, and from sewer systems, leaking tanks, and separators.

35. The combined multiplier resulting from multiplying the above two multipliers by one another is 0.78% -- meaning that if the crude throughput in 1972 was 100 million barrels, the amount counted for allocation purposes would be 780,000 barrels. As noted above, this would mean that the impact on response costs of the year 1944 would be more than 125 times greater than the impact of the year 1972. There is no factual basis for concluding such an impact. Further, there is no support for application of this multiplier to all of the units and groundwater areas for which costs are claimed, which include:

- **Old Silt Pond --** Past Costs plus Interest = $11,879,704
- **Rice Paddy Landfarm** -- Past Costs plus Interest = $7,711,388
- **Solid Waste Management Unit (SWMU) Investigation/ Remediation** -- Past Costs plus Interest = $6,567,788
- **Shallow Fill Zone Area** -- Past Costs plus Interest = $5,112,715
- **PRP Investigation** -- Costs plus Interest = $128,346

36. One example of the inappropriateness of applying Exxon's methodology across the board at Baton Rouge is its application to the Old Silt Pond (OSP) and the Rice Paddy Landfarm (RPL), which comprise 58% of the response costs at Baton Rouge. Neither the OSP nor the RPL appear to have been in use during the 1941-1945 period. Thus, there would be no basis to count these years, or the allocation percentage calculated for these years, in the U.S. allocation for these units, and no basis to apply adjustment multipliers to compare later years to the 1941-1945 period for these units. Furthermore, as detailed in my November 16, 2012 report,[18] the response costs related to closure of these units as they were reconfigured in the 1970s. The area of the OSP for which costs are being claimed was created after 1974 as an entirely different waste disposal impoundment for such wastes as API separator sludge, slop oil emulsion solids, dissolved air floatation float, heat exchanger bundle cleaning sludge, cooling tower sludge, wastewater treatment sludge, certain slop tank sludge, and stormwater basin sludge. The RPL was developed in 1976 for use as a landfarm for a variety of wastes including API separator sludge, slop oil emulsion solids, dissolved air floatation float, heat exchanger bundle cleaning sludge, cooling tower sludge, wastewater treatment sludge, certain slop tank sludge, and stormwater basin sludge. Mr. White has not provided any explanation of how any reductions in slop oil recorded in 1952 would have impacted contamination being remediated in the OSP or RPL nor how he has accounted for the fact that the wastes accumulated after 1974 in the OSP and 1976 in the RPL may well account for the major portion of the contamination in these units.

Plancor Impacts on Response Costs for Refinery Units and Groundwater

37. Other aspects of Exxon's methodology also depart from its claimed production-based approach. In addition to the BOW (discussed above) the U.S also owned 3 plants (denoted "Plancors") adjacent to the Baytown refinery that were constructed and operated by Exxon and a few Plancors adjacent to the Baton Rouge refinery that were constructed and operated intermittently by Exxon. These Plancors (most of which were acquired by Exxon between 1952 and 1955) were not part of the refinery operations, and I am not aware of any data to suggest that their production output was proportionally related to the increases in crude throughput of the

[18] *See*, generally, Low November 16, 2012 Report at pp. 13-15.

refinery or that a certain percentage of wastes from the Plancors impacted the units, soils, or groundwater contamination areas at the refinery. The Plancors had separate API oil/water separators, and the effluent from those units was discharged at an outfall entirely distinct from the refineries' main outfalls during the time they were owned by the U.S. So with the exception of some minor waste streams that may have been processed through the refinery treatment systems from time to time, the Plancor waste systems operated independently and any proposed relationship between response costs for remediating solid waste management units or groundwater at the refineries and those at the Plancors is speculative at best. [19]

38. In Exxon's methodology, however, it is assumed that the Plancors account for 10% of the "production" or waste load impact of the Baytown Refinery. I am unaware of any data produced by Exxon to substantiate this percentage, but it is a component of some importance in Exxon's methodology because Mr. White allocates a higher percentage of U.S. liability (80%) to the Plancor impacts than he does to the U.S. liability for refinery impacts (60%). Although there is evidence that one Plancor waste stream was treated for a certain period of time in the Baytown refinery waste treatment system, and therefore, may have impacted the effluent discharged through the separators and into adjacent water bodies, there is no basis to conclude that the Plancors, which were nowhere near the areas of groundwater contamination at the refinery, had any significant impact on releases of contaminants into the groundwater.

ALLOCATING THE SHARE FOR THE PERIOD OF JOINT EXXON/U.S. INVOLVEMENT BETWEEN EXXON AND THE U.S.

39. Once the joint Exxon/U.S. share is calculated for the response costs at issue, Exxon allocates that share between the U.S. and Exxon based on a series of judgments concerning:

- what aspects of the refinery output the U.S. was involved in; and
- how to weigh the U.S. degrees of involvement in those aspects compared to Exxon's degree of involvement.

40. On the first point, Exxon's approach assumes that the U.S. liability and allocation should be related to 100% of the refinery's output for the years 1942-1945 and 1950-1953 based on an implicit assumption that 100% of crude throughput should be counted in any share calculated for the U.S. for those years. This assumption is predicated on the fact that it was the objective of the U.S. that Exxon maximize the production of Avgas and that maximization was an indicia of U.S. control over 100% of the plant's production. The record, however, establishes that the production of Avgas accounted for only 14% of Baytown refinery's output and 19% of the Baton Rouge refinery's output during WW II and only about 1% of total refinery output at both refineries during the Korean War. The government's proposed allocation methodology does recognize that, in addition, to Avgas, another 15-20% of refineries' output during WW II was what Exxon classified as war products or critical war products. On that basis, the

[19] *See*, Low August 10, 2012 Report at pp 28-29.

government's allocation approach recommends that approximately a third of each plant's output be considered as part of the plant's production in which the U.S. had some involvement during WW II. A large percentage of the WW II refinery output was for domestic products (e.g., automobile gasoline, home heating oil, etc.) similar to production prior to the war, and the AvGas contracts establish that this production was for Exxon's account. Therefore, in my judgment, there is no basis for holding the U.S. accountable for contamination associated with the production of these products.[20]

41. Although Exxon added some equipment in order to prioritize and maximize the production of Avgas during WW II, the basic operations conducted by Exxon at the refineries did not change significantly and any equipment that was added was quickly incorporated into routine production of even higher quality domestic products once the wartime period ended. This is unlike other WW II cases I have been involved in, such as conversions of automobile plants to manufacture military aircraft parts or the conversion of fireworks plants to manufacture military ordnance, where 100% of the plant output was altered because of WWII wartime conditions. Exxon's predecessors did prioritize Avgas, but they also plainly continued to make, and to profit from, a wide array of domestic products.

42. In the case of the Korean War, Mr. White's suggestion that the U.S. allocation be based on 100% of the refinery output is plainly misplaced. I am aware of no evidence that any modifications to the Baytown or Baton Rouge refineries were necessary during the Korean War to produce the minimal amount of Avgas produced by these refineries, in each case amounting to only about 1% of total refinery output.

43. Regarding comparative degree of involvement (which Mr. White denotes as "inter-class"), Exxon's allocation methodology is based on the categorization of either Exxon or U.S. as an "owner" or "operator," as those terms are used in Section 107 of CERCLA to denote categories of liable parties. Exxon's approach assumes that owner liability (e.g. Exxon ownership of the refinery and U.S. ownership of the Plancors and the BOW) should be allocated 20% of the share and that operator liability should account for 80% of the allocation share. These percentages are generally judgment calls within the ultimate discretion of the court to determine. When more than one entity allegedly falls into one of the categories, allocation between them is more fact-dependant, although it also is a determination ordinarily left to the court's judgment. In this case, Exxon's approach assumes, not only that the U.S. was an operator of the refineries during WW II and the Korean War, but that the U.S. should be allocated 75% of the operator share during both periods. In my opinion, such an allocation would be unprecedented. Even if the U.S. is determined by the court to be liable as an operator of the refinery during either the WW II or Korean War periods there is no basis to allocate the U.S. 75% of the operator share during both periods Mr. White offers a few conclusory sentences in his report to justify this suggestion, but does not cite evidence that any entity other than Exxon was in full control of operations of the refinery during WW II and the Korean War.

44. The end result of Exxon's approach is that the U.S. is allocated a 60% share against 100% of refinery output for both the WW II and the Korean War periods, a result which,

[20] *See*, Low August 10, 2012 Report at pp. 15-16.

in my opinion, is neither supported by facts in the record or sustainable on an equitable basis. It is a particularly egregious result in the case of the Korean War period.

"Delay Component"

45. Exxon's "production-based" approach combined with its allocation of equitable shares between the U.S. and Exxon generates a 17.16% base case[21] allocation percentage for the U.S. at Baytown and 10.23% at Baton Rouge. Exxon's allocation approach adds another component to the "production-based" methodology, denoted the "delay component." Application of the "delay component" adds an additional 6.10% to the U.S. share for the Baytown refinery units and groundwater areas (for a total of 23.26%) and an additional 4.11% for the Baton Rouge refinery units (for a total of 14.34%). This factor is predicated on an assumption that the U.S. was responsible for delaying some aspects of Exxon's proposed waste reduction measures. It is a relatively complicated component, not very well explained in Mr. White's reports. It is difficult to explain briefly. However, as the increased percentages noted above indicate, application of the "delay component" increases the U.S. allocation by 35%-40% above the base case percentage.

46. In brief, the "delay component" assumes that the U.S. should be held responsible for a significant portion of the refinery contamination impact (i.e., for a certain percentage of crude throughput) during years when the U.S. was not involved in the refinery proper. At Baytown, in each year from 1946-1959, he allocates a certain percentage of the crude throughput (up to 45%) using his WW II degree of involvement allocation percentages. For example, as discussed in my November 16, 2012 report, with respect to Baytown, in 1948, at a time when the U.S. was not involved in refinery operations, Mr. White allocates 35% of the response cost impacts (i.e., 35% of the crude throughput for that year) based on the U.S. inter-class (degree of involvement) percentage that he uses during World War II (i.e., 60%) rather than the U.S. inter-class (degree of involvement) percentage that he uses for years after the war (i.e., 0% for the period 1946-1950).

47. I have discussed the "delay component" in detail in my November 16, 2012 Rebuttal Report[22] and the U.S. Summary Judgment motion also contains a detailed discussion of the facts related to any alleged U.S. responsibility for delay. In summary, the assumptions underlying this component are not supported by the record. Mr. White's reports do not spell out the factual basis for the method he uses in applying these assumptions, nor does he provide any plausible basis for the percentages of crude throughput capacity in the years after WW II that he assigns to the delay component. As such, it is not clear how his mathematical construct fairly captures his proposed version of what happened. At the very least, the method could not be considered a commonly-accepted methodology.

[21] "Base case" is a term I am using to denote the percentage before application of the "delay component" and the contract claim.

[22] *See*, Low November 16, 2012 Report at pp. 18-21.

Contract Claim

48. For both Baytown and Baton Rouge, Mr. White adds a significant percentage to the U.S. allocation to account for Exxon's claim that the U.S. should indemnify Exxon for costs arising from production of Avgas under World War II contracts. Mr. White's calculation assumes that, if a court finds the indemnity applicable, the U.S. would assume 100% of the costs arising from contamination stemming from 100% of the production output at the refineries during World War II. Thus, his methodology for calculating this increase assumes that production of Avgas was responsible for 100% of the waste generated during World War II. His addition of the contract claim increases the U.S. share at Baytown from 23.26% to 31.34% and at Baton Rouge, from 14.34% to 20.9%.[23]

49. As discussed above, the actual percentage output of Avgas at Baytown and Baton Rouge was 14% and 19% respectively. Even if the impact on waste generation was proportional to the percentage of output, the impact of World War II Avgas production on the wastes generated and the response costs at issue was certainly not close to 100%. However, there also is a dispute as to whether the impact on response costs of Avgas production would have been proportional to output, since facts in the record demonstrate that much of the Avgas was produced by blending raw materials from crude that had been process at facilities other than Baytown and Baton Rouge. Exxon's own documents show that blending operations produce far less waste than crude oil processed through the refineries' distillation and cracking units.

CONCLUSION

50. In my opinion, Exxon's allocation methodology is based on too little factual support and too many unreasonable assumptions.

51. The joint Exxon/U.S. period share produced by Exxon's calculations for Baytown -- approximately 50%, including almost 18% for just the four-year WW II period -- seems well beyond a share that would result from a reasoned consideration of the evidence available on the operating history of the refinery. The method uses several adjustments to production output (as a proxy for waste load impact) that I could never find acceptable inasmuch as they are not empirically supportable, and not supported by sound science. The increase in this percentage by application of the "delay component," which is wholly unsupported by the record, applied in a wholly arbitrary manner, and based on no factual or analytical correlation to response costs, only accentuates that this appears to be a result-oriented methodology.

52. Moreover, Exxon's approach in allocating the joint Exxon/U.S. share of refinery production adds further to the inequity of Exxon's allocation. Exxon assumes that optimizing the production of Avgas justifies including 100% of the refineries' output in the wartime total attributable to the U.S. The evidence, however, suggests that the refineries considered only

[23] The contract claim applies a degree of involvement (i.e., "inter-class") allocation of 100% to the U.S. for the WW II wartime period (instead of 60%). The "delay component" also magnifies the effect of applying the contract claim since the 100% inter-class allocation percentage is carried forward into the years 1946-1959 – i.e., the U.S. is allocated 100% for the percentage of crude throughput capacity attributed to the "delay component" in those years.

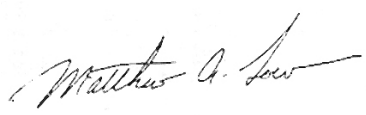
approximately 30-40% of WW II output as "war products," taking into account both Avgas and other war products. Both refineries continued to produce a majority of non-war-related products. Further, Exxon's allocation effectively assumes that the entirety of the refineries' output would be relevant during the Korean War even though less than 1% of that output was Avgas for the war effort, and there is no data indicating whether any other "war products" were produced.

53. Finally, Exxon's suggestion that the U.S. should be held accountable for 75% of the operator share during WW II, and the Korean War is, in my opinion not supported by the record and highly questionable. That application of the "delay component" extends this allocation to years other than the WW II and the Korean War periods only exacerbates the inequity.

54. In summary, in my opinion, Exxon's conclusions are unreasonable given the known facts, and the assumptions relied on by Exxon to increase the U.S. share are largely without basis.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Dated this 20th day of December, 2013.



Matthew A Low